

Improving Performance through Knowledge Translation in
the Veterans Health Administration

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Abstract

The Veterans Health Administration (VA) provides a case study for linking performance measurement, information technology, and aligned research efforts to facilitate quality improvement in a large, complex health system. Dialogue between clinical researchers and VA leaders occurs through structured activities (e.g., the Quality Enhancement Research Initiative) and engagement with formal policy-making bodies (e.g., development of clinical guidelines and performance measures), as well as informally through local, regional, and national workgroups responsible for implementing evidence-based clinical initiatives. Important lessons for knowledge translation from the VA experience include the following: 1) research needs to generate clinical evidence relevant to the needs of patients served by the health system; 2) researchers need to systematically study the process of evidence implementation itself to increase the capability of the health system to improve performance; 3) although print and web-based dissemination structures are important, direct accessibility of researchers to policy-makers and clinical leaders through formal and informal mechanisms is key; and 4) both “top-down” and “bottom-up” activities are needed to integrate evidence-based practice across a large health system. As VA care moves from hospital and clinic into community-based settings and faces a new veteran population with different needs and expectations, knowledge translation activities must develop new forms of evidence and more direct interaction with veterans and their caregivers.

Lessons for Practice

- Research must be linked to the needs of patients and system performance
- Systematic study of implementation is important for improving performance
- Direct interaction between researchers and policymakers enhances relevance and uptake of findings
- Both “top-down” and “bottom-up” activities are needed

As the largest integrated delivery system in the United States, the Veterans Health Administration (VA) is responsible for treating 5.2 million patients annually at over 1,300 sites of care, including 172 medical centers and hospitals, 871 clinics, 207 readjustment counseling centers, and 134 nursing homes. VA patients are older, sicker, and poorer than the general US population; 49% are over 65 years of age, and 70% have annual incomes less than \$26,000. While the number of veterans served by VA has more than doubled since 1995, VA has made measurable strides in access, quality, and patient satisfaction with 10,000 fewer total staff than a decade ago. Although there are many ongoing challenges to its mission and continuing opportunities for improvement, VA outperforms other health systems on standardized measures of quality¹ and is widely considered to be among the best health systems in the US.²

VA has not always had the reputation for quality. In the 1980s and 1990s, the public perceived it as a large, inefficient bureaucracy providing poor care to patients with nowhere else to go. Facing intense scrutiny from Congress, VA had to dramatically improve in order to demonstrate its value to the taxpayer. This journey involved many components including a transformation into a culture based on accountability for continuous improvement of performance. A loose confederation of hospitals was reorganized into 22 networks of facilities that encouraged innovation and integration of care. Resource allocation was updated to create incentives for delivering appropriate services in the most efficient setting. Primary care and information technology benefited from significant investments and became the underpinning of enhanced continuity and coordination of care. Finally, evidence-based quality measures and practice guidelines

were adopted system-wide, and senior managers were held accountable to meet or exceed specific performance targets.³

Evidence derived from research done within VA as well as elsewhere was an essential ingredient in this transformation, and, accordingly, knowledge translation, defined as “the exchange, synthesis, and ethically sound application of knowledge – within a complex system of interactions among researchers and users to accelerate the capture of the benefits of research”⁴, has been an important facilitator. VA is uniquely positioned as a care delivery system for knowledge translation because it funds research, employs clinicians actively engaged in research, has affiliations with 107 academic health systems, and educates almost 90,000 physicians and associated health professionals annually. Many of VA’s clinician investigators also hold leadership positions within VA at local, regional, and national levels. Since 1995, VA has reaffirmed its longstanding commitment to education and research and realigned those activities to better serve the needs of veterans and the delivery system.^{5,6} Specific structures and initiatives were created to facilitate bringing researchers and policy-makers together to shape key decisions. The purpose of this paper is to describe some of these activities, to glean from them key lessons on knowledge translation that can be generalized to other health systems, and to outline new challenges and opportunities as the needs of veterans evolve.

Knowledge Translation and VA’s Quality Transformation

Deficiencies in the quality and safety of health care have been extensively documented and take the form of inappropriate underuse, overuse, or misuse of interventions relative to the available scientific evidence regarding their effectiveness,

harms, and costs.⁷ VA's quality transformation has been extensively documented, as well as the primary drivers of that change – structural changes that included expanded primary care, explicit measurement and accountability for quality and value, and the development of an information infrastructure supporting the needs of patients, clinicians, and administrators.^{3,8,9} The quality gains within VA have not been limited to those specific measures being tracked for performance monitoring. Overall measures of care for a condition of interest have shown improvement (“halo effect”) even when they are not a specific element in a report card, indicative of broad quality improvements focused on moving the system of care to correspond with evidence-based guidelines. For instance, improvement was observed across 13 separate measures of diabetes care and 20 measures of chronic obstructive pulmonary disease care, despite only a few of those disease indicators being targeted within VA's performance monitors.¹

Knowledge translation activities, both formal and informal, contributed to these drivers of quality improvement. VA's performance measures, for instance, are tightly linked to specific clinical guidelines developed in collaboration with the Department of Defense (DoD). The VA/DoD Evidence-Based Practice Workgroup follows a highly structured procedure for identifying and synthesizing evidence into recommendations, and critically reviews each module of a guideline for scientific merit, clinical relevance, and applicability to the patient populations served by the federal health care system.¹⁰ These discussions bring together clinical experts, researchers, and policymakers to tailor the recommendations to best meet the needs of our patients. These guidelines may differ from recommendations endorsed by other groups based on VA-relevant research – for

instance, VA recommends a risk-stratified approach to retinal screening based on studies of the progression of diabetic retinopathy within veterans.¹¹ Less formal activities can be equally important. Researchers are frequently invited to participate on teams and workgroups engaged in drafting or implementing clinical policy. This approach is used, for instance, in the national rollout of VA initiatives to address obesity and physical inactivity.¹²

The development of clinical guidelines and performance measures is as much a “bottom-up” as a “top-down” activity within VA, belying the common misconception that, as a federal health system with many connections to the military, change occurs through “command and control”. This is evident in VA’s performance management system. Within VA, managers are held accountable for achieving specific targets on evidence-based measures of quality. Those quality indicators are, for the most part, focused on specific practices within VA clinical guidelines that have the strongest and most consistent evidence as well as a noticeable gap between actual and desired performance. The actual performance measures, which are cascaded through all levels of VA, are developed collaboratively by a workgroup that includes researchers, field-based clinicians, and administrators. These indicators usually undergo a year of field testing and review by the committee before being incorporated into the annual performance contract for VA leadership.

Additionally, considerable latitude is given on how to reach performance targets at the local level. There are wide variations across VA facilities in approaches towards implementing clinical guidelines and performance measures. Even with a national

electronic health record, local clinicians (many of whom are clinical and health services researchers) have the flexibility to develop site-specific computerized tools such as clinical reminders (CR). One of the most important insights gained from VA's efforts in knowledge translation is the importance of customizing interventions to local conditions.¹³

Generating Evidence for the Needs of Veterans: the Role of VA Research

One of VA's statutory missions is to conduct research that will enhance the health of veterans as well as the nation. VA's research program has been exceptionally productive and encompasses a wide array of projects in the laboratory sciences, clinical sciences, health services research and development, and rehabilitation research and development. Currently within VA, the annual budget for direct support of medical and prosthetics research is \$412 million, although combined intramural and extramural support (including the salary support of clinician-investigators) approaches \$1.7 billion.

Because VA investigators are embedded in a fully integrated delivery system with a stable patient population and an unparalleled information infrastructure, the opportunities to translate clinical questions into research studies and research findings into clinical actions are abundant. More importantly, there are mechanisms to immediately disseminate and implement those findings. For instance, since 1946, the VA has conducted multi-site clinical trials and has maintained a network of regional support centers that facilitate the evaluation of both standard and novel therapies - the VA Cooperative Studies Program (CSP).¹⁴ This unique mechanism for conducting clinical trials of great practical significance to VA¹⁵ has generated much of the evidence currently

found among the clinical guidelines in use within VA, for example, the routine use of aspirin for acute coronary syndromes¹⁶ and use of gemfibrozil for secondary prevention of heart disease in veterans with low levels of high-density lipoprotein cholesterol.¹⁷ Because some research discoveries are best implemented through partnerships with industry – this is particularly the case for new technologies – VA’s Office of Research and Development has recently established a Technology Transfer Program that tracks, evaluates, and disseminates VA supported discoveries and inventions, obtains patents, fosters collaborative agreements, and facilitates the commercialization of new technology. While these discoveries have not yet reached the point of integration into routine medical care, there have already been a number of promising developments, including a urinary biomarker for improved detection of prostate cancer and a genomic marker for schizophrenia.

VA’s Health Services Research and Development (HSR&D) program has figured prominently in transforming the quality of the system. VA’s uniquely comprehensive administrative and clinical data systems (including a fully integrated electronic patient record) have provided opportunities for HSR&D investigators to analyze VA operations and performance as well as determine the impact of system interventions. These projects have had a major impact on policy decisions. For instance, research supported by HSR&D identified the optimal timing of screening for diabetic retinopathy to avoid vision loss¹¹ and helped VA to assemble the business case for providing resources to primary care.¹⁸ HSR&D also supports VA’s Quality Enhancement Research Initiative (QUERI), described in detail later in this article.

Traditional pathways of research dissemination include peer-reviewed publications and presentations at scientific conferences. VA research is often highlighted in settings designed for academic audiences, but these activities are insufficient for the needs of policymakers. The VA Office of Research and Development supports several programs specifically designed to facilitate knowledge transfer. These include periodic “State of the Art” conferences that bring researchers and managers together to discuss current evidence and set policy direction and goals for future research. Additionally, when policy makers seek research input for specific questions, the HSR&D Management Consultation Program can link them with researchers that have appropriate expertise. When there are critical knowledge gaps, special rapid response studies may be commissioned to obtain useful data in the shortest possible timeframe. Currently, there are over a dozen such projects underway in VA; active projects include: the development of a database to track indicators of the quality of nursing care; assessment of facility practices that improve the timeliness of acute coronary interventions; and computerized tracking of colorectal cancer screening. In the planning phase are projects involving missed and cancelled appointments and evidence-based assessment of post-traumatic stress disorder.

An additional resource is the Center for Information Dissemination and Education Resources (CIDER), whose mission is to make findings and information from VA research accessible to policy makers, managers, clinicians, and researchers throughout VA and the larger health care community.¹⁹ CIDER monitors the VA research portfolio and publications for important findings and develops products and activities that provide

an informational bridge to potential users of that knowledge and information. These products include one page, targeted internal publication briefs for key VA decision-makers as well as more detailed publications that cover a topic area (e.g., a series of primers for field-based staff and managers). Such materials are not merely posted on a web site, but actively disseminated through email lists targeted to defined target communities and senior VA leaders (e.g., mental health briefs would be forwarded to mental health leaders). CIDER coordinates State-of-the-Art conferences, as well as an annual meeting that brings HSR&D investigators together with VA clinical leaders and policymakers.

Implementing Evidence: VA QUERI and Related Activities

Recognizing that conducting research, publishing in medical journals, and repackaging those findings for dissemination to internal audiences was not sufficient to accelerate system change, VA initiated the Quality Enhancement Research Initiative (QUERI) in 1998, as a comprehensive, data-driven, outcomes and output-oriented approach to quality improvement.²⁰ Currently, there are ten active QUERI groups, each comprising a multi-site, interdisciplinary group of investigators, clinicians, and leaders focusing on a disease or condition selected because of its high prevalence among veterans and its burden on the VA healthcare system.²¹ QUERI groups follow a defined process for identifying performance gaps, implementing empirically-based practices, refining the interventions based on ongoing evaluation, and measuring the impact on outcomes and quality of life. To insure that QUERI stays connected with the end-users of their work, each center has an Executive Committee, an internal governing body that includes

researchers and policy-makers, and is required to submit an annual plan and report that is reviewed by a Research and Methodology Committee that assesses whether the work has had impact on VA care delivery, as well as what gains have been made to understanding the process of quality improvement and implementation of evidence. Because quality improvement interventions are resource intensive and largely untested,²² this second mission is critically important.

One barrier to action-oriented research such as QUERI is the difficulty of funding such collaborative projects through existing scientific grant mechanisms. Traditional standards of scientific rigor presume the ability to control all variables other than the one being studied in order to achieve internal validity. However, such an approach often leads to the creation of an artificial environment that does not resemble the “messy” world of clinical practice. QUERI overcame this barrier by initiating a unique funding and peer-review mechanism, the Service Directed Project, which attempts to balance the needs of rigor and relevance and emphasize the importance of applicability and sustainability (external validity) within the practice environment of VA.²³ Service Directed Projects are reviewed by researchers, clinical leaders, and policymakers, involve implementation researchers in hands-on facilitation of change at the local level, and integrate the perspectives of local clinicians and managers to improve the sustainability of interventions after project completion.¹³ Current QUERI projects are shifting their emphasis toward patient self-management (e.g., use of peer counseling to improve diabetic self-care) and are also working with key VA offices involved in the

implementation of the personal health record (My Health_eVet) and distance technologies for care coordination in home and community-based settings.

Many QUERI projects have resulted in breakthrough levels of improvement, such as doubling rates of influenza vaccination among veterans with spinal cord injury²⁴ as well as other important impacts on VA care (TABLE). Not all QUERI projects are successful, but insights into implementation can be gained even when those projects fail to achieve their goals. For example, when computerized clinical reminders developed for the care of patients with human immunodeficiency virus infection did not achieve their desired impact, important insights were gained about the human factors that influence the effectiveness of the electronic health record.²⁵

Although many QUERI projects have resulted in peer reviewed publications, much of the work has gone unpublished, reflecting the difficulty of finding appropriate venues for implementation studies that emphasize external over internal validity. Recognizing the need to advance the field of implementation by promoting the sharing of insights and results among scientific peers, VA QUERI has recently participated in the establishment of an on-line, peer-reviewed journal focused on implementation science.²⁶

New Challenges

VA is constantly evolving to provide more effective health care and address the changing needs of the veteran population. The conflicts in Iraq and Afghanistan have brought a renewed sense of mission, while introducing to the system thousands of young men and women with war-related wounds and trauma. For the first time in the history of combat, large numbers of soldiers are surviving blast injuries, in part due to protection of

body armor and the availability of prompt and effective surgical care.²⁷ The syndrome of “polytrauma”, which includes traumatic brain injury, major amputations, sensory loss, and mental illness, challenges the traditional approach of developing and disseminating evidence for *one disease at a time*. These conditions interact in complex ways and require tailoring care instead *one patient at a time*.

Developing the evidence base to care for polytrauma poses many challenges for VA research. Traditional randomized clinical trials are difficult if not impossible in such situations, making pragmatic trials and robust non-experimental designs essential.¹⁵ Outcome measurement requires new approaches that go beyond traditional generic measures of quality of life. Tailored assessment tools are needed to capture the complexity of injury (e.g., the high prevalence of traumatic brain injury resulting in subtle or substantial cognitive loss) as well as the uniquely high level of pre-morbid function (today’s soldier is best likened to a high-performance athlete). After the acute period, these veterans will be initially treated in specialized referral units but soon return to their communities for continued recovery, so distance technologies are critical to maintain access to specialized expertise and ensure longitudinal follow-up. Equally vital will be the needs of their informal caregivers, which may include working spouses or aging parents. VA’s newest QUERI center is focused on using rapid research and translation cycles to address the complex needs of polytrauma survivors.

Even veterans without physical injuries from combat pose new challenges. Nearly one in six returning combatants show evidence of depression or post-traumatic stress, yet many are reluctant to seek specialized mental health care. Integrating

assessment and treatment of these problems within primary care settings is a knowledge translation challenge that relies on nearly two decades of study demonstrating the effectiveness, acceptability, and efficiency of collaborative management.²⁸ QUERI researchers are actively working with system leaders to implement this model of care across VA.

The veteran population is changing in other ways. Women's health is a priority for VA research, as there now are 1.7 million women veterans, a number that is rapidly growing as the proportion of women in the active military (currently 15%) increases. Much work needs to be done to determine how well specific women's health issues are being addressed.

The veterans of today, like their civilian counterparts, seek timely information about health issues through the internet, expect responsive service from health providers, and desire active involvement in their care. These traits pose a challenge to medical practice based solely on the authority of the clinician but may actually enhance evidence-based care through active engagement of patients in self-management. VA is refining its electronic health record to become a web-accessible personal health record that incorporates evidence-based patient reminders and high quality educational material. Already, VA researchers are addressing the patient perspective in knowledge translation – one example is the incorporation of consumer representatives on the Executive Committees of QUERI centers.

Lessons for Other Systems

Research has been criticized for being more focused on rigor than relevance. The VA experience demonstrates that both are possible, and that the benefits can be translated in a timely fashion when there is active dialogue among researchers, clinicians, and policymakers. In contrast to a view of knowledge translation as a unidimensional pipeline, this is a two-way interaction in which the research questions are shaped by measures of veteran need and system performance, and supportive structures allow research outputs to be implemented as formal practice and policy. Outsider observers have commented how essential these interactions have been for VA's quality transformation,^{29, 30} although the complexity of health care system change forces us to acknowledge that neither their comments nor this case study constitute rigorous proof of that assertion. Nonetheless, as other health systems have struggled to achieve similar goals as VA, we believe there is value for others in these lessons.

The total investment in VA research is significant, but represents less than 5% of the system's medical care budget. Long recognized as a key competitive advantage for recruiting physicians to VA, the realignment of research activities around veteran priorities has made researchers essential partners with clinicians, managers, and policymakers in setting directions and shaping key decisions that improve effectiveness and narrowing the gap between evidence and practice. In addition to partnerships, many physicians, nurses, and other clinicians in VA engage in research and scholarly activity while holding local, regional, or national leadership positions, which brings an appreciation of evidence-based practice to policymaking and itself accelerates knowledge translation.

The formal budget for knowledge translation and implementation with the QUERI program and related activities – about \$15 million for fiscal year 2006 – are modest when compared to a medical care budget approaching \$30 billion. Relative to the well-documented quality and safety gaps within the US healthcare system, it can be argued that such investments are essential to any delivery model. While VA is a federal health provider that obtains the majority of its resources through public sector funding, it faces the same challenges as other systems, and much can be gained from sharing and mutual learning. It has been proposed that the support of such activities could derive from a consortium of public and private entities, including health plans, hospital systems, and drug companies, which have an shared stake in effectively linking research to clinical practice and policymaking.³¹ Other notable ingredients of the VA transformation – accountability for performance, and a system-wide electronic health record, are similarly being developed and tested in the private sector. For those reasons, we believe that the VA experience provides credible lessons for knowledge translation throughout the US healthcare system..

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TABLE: Selected Impacts of VA QUERI

- Improving influenza and pneumococcal vaccination rates in spinal-cord injured veterans
- Facilitating the spread of collaborative care for depression in VA primary care settings
- Implementing computerized decision-support for treatment of hypertension
- Demonstrating improved diabetes care in VA compared with commercial managed care
- Identifying and addressing barriers to prompt revascularization in patients with acute coronary syndromes
- Improving colorectal cancer screening rates and facilitating diagnostic colonoscopy for patients with occult blood in stool